

Remarks

Reconsideration of the above-identified application is respectfully requested. Claims 1-20 are pending in this application.

In the Office Action mailed July 21, 2004, the Examiner rejected claims 1-20 under 35 U.S.C. §102(e) as anticipated by U.S. Patent Application Publication No. US 2003/0236945 A1 ("the '945 publication"). In response, the Applicants respectfully traverse the Examiner's rejection of those claims for the reasons set forth in detail below.

Rejection of Claims 1-20 Under 35 U.S.C. §102(e)

As noted above, in the July 21, 2004 Office Action, the Examiner rejected claims 1-20 as anticipated by the '945 publication. The Applicants believe, however, that those claims are not anticipated by that reference.

As recited in independent claims 1 and 6, the Applicants' invention is directed to a system and method for managing a plurality of virtual storage volumes available to a user for use in storage and retrieval of user data. The claimed invention comprises automatically allocating at least two of a plurality of storage devices to a pool, and linking at least one of the plurality of virtual storage volumes to the pool. As recited in independent claims 11 and 16, the Applicants' invention is directed to a virtual volume management system and method. The claimed invention comprises automatically allocating at least two of a plurality of storage devices to a storage pool linked to at least one of a plurality of virtual storage volumes available to a user for use in storage and retrieval of user data.

The '945 publication is directed to storage virtualization in a storage area network. Virtual storage volumes are presented and appear to a host as being connected to a storage area. The virtual volumes represent available physical storage devices, which are listed in storage pools. In operation, the host sends a storage request to a virtual address in a virtual

volume, which address is translated into physical storage locations where data is saved. (*See, e.g., '945 Publication; ¶¶ 57, 102.*)

The '945 publication also discusses management of the storage pools and virtual volumes in the storage area network. In that regard, the '945 publication discloses that storage pools and virtual volumes may be managed manually, indicating that a system administrator may create and/or delete both storage pools and virtual volumes. (*See, e.g., '945 Publication; ¶¶ 105-107, 110-112.*)

Significantly, however, with respect to automatic management, the '945 publication fails to teach or suggest that storage pools may be managed automatically. Instead, the '945 publication discloses only that virtual volumes may be managed automatically, indicating that application program interfaces may also create and/or delete virtual volumes:

[0108] 2. A first Application Program Interface (API1) enabling a user application computer program to manage Virtual Volumes without "human intervention."

[0109] 3. A second Application Program Interface (API2) permitting a "storage application" computer programs to manage Virtual Volumes without human intervention.

* * *

[0113] By another method of management, the SVM 3 operates an API1 to permit to any user application program, running in any one of the hosts 1 to handle Virtual Volume management. The API1 consists of a set of functions running in the NT of the SVM 3, and may be accessed by any application program, via the user network 6.

[0114] For every management task available manually to the System Manager via the GUI (Graphical Utility Interface), a parallel API1 function may be called remotely. These parallel functions include, among others, commands such as "Create Virtual Volumes", "Delete Virtual Volumes", "List the number of Virtual Volumes", and so on. Many types of application programs may take advantage of the API1 facility, for example,

a backup application program may send a request to reassign the permission attributed to the Virtual Volume(s) to a backup server and then, commands operation of the program backup run.

[0115] The management of Virtual Volumes may thus be driven automatically by a first API1 configured for use with user application programs, if the necessary list of parameters is supplied by the user.

[0116] Storage Applications programs are applications recognized as being SAN-centric as opposed to host-centric operations. An API2 runs the virtualization SVM Driver 60 and is an integral part of the SVM 3 system. Similar to the user application programs, the storage application programs may also request Virtual Volume management function from the SVM 3. In this case, those request flow through the storage network (Fiber Channel or other) instead of via the users network. The reason is that the storage application programs are part of the SVM 3 and the internal protocol between the SVM 3 and the SVM Driver contains the API2 requests.

[0117] The management of Virtual Volumes may thus be driven automatically by a second API2 configured for use with storage application programs, if, as before, the list of necessary parameters is supplied by the user.

(‘945 Publication; ¶¶ 108-109, 113-117 (emphasis added).)

Thus, contrary to the Examiner’s contention, all of the functions available to the system administrator are not also performed automatically by the application program interfaces. As is apparent from its context, the statement in the ‘945 publication that a parallel application program interface function exists for every manually available management task is clearly a reference only to the management of virtual volumes. While the ‘945 publication discloses that virtual volume management functions may be performed automatically by the application program interfaces, it does not teach or suggest that storage pool management functions may be performed automatically by the application program interfaces. Indeed, there does not appear to be any description in the ‘945 publication of automatic storage pool management. Instead, as noted above, it appears that the only type of storage pool

management described in the '945 publication is manual. (*See, e.g.*, '945 Publication; ¶¶ 105-107, 110-112.)

The '945 publication therefore fails to teach or suggest automatically allocating at least two of a plurality of storage devices to a pool, as recited in independent claims 1, 6, 11 and 16. Indeed, in that regard, the '945 publication suffers from the same problems associated with the prior art discussed in the present application, which the Applicants' claimed invention overcomes. (*See, e.g.*, Specification, p. 1, l. 11 - p. 2, l. 24; p. 5, l. 11 - p. 11, l. 8.)

As a result, for at least the foregoing reasons, the Applicants believe that independent claims 1, 6, 11 and 16 are not anticipated by the '945 publication. Reconsideration of the Examiner's rejection of those claims under 35 U.S.C. §102(e) is therefore respectfully requested.

Claims 2-5, 7-10, 12-15 and 17-20 depend either directly or indirectly from independent claims 1, 6, 11 and 16, respectively, and include all the limitations thereof. As a result, and for at least the reasons set forth above concerning independent claims 1, 6, 11 and 16, the Applicants believe that claims 2-5, 7-10, 12-15 and 17-20 likewise overcome the Examiner's rejection thereof under 35 U.S.C. §102(e), and reconsideration of that rejection is also respectfully requested.

Moreover, it should be noted that the '945 patent also fails to teach or suggest, as recited in claims 4, 5, 9, 10, 14, 15, 19 and 20, a system or method wherein the plurality of storage devices, at least two of which are automatically allocated to a pool, comprises a virtual device such as a virtual volume or a virtual disk. Instead, as previously described, the '945 publication discloses only that storage pools are lists of physical storage devices available in the system. Indeed, the '945 publication describes virtual volumes only as presented and appearing to a host, not as storage devices that may themselves be part of a pool. (*See, e.g.*, '945 Publication; ¶¶ 57, 102.)

Conclusion

For at least the foregoing reasons, the Applicants believe that claims 1-20 meet both the formal and substantive requirements for patentability, and that the application is in condition for allowance. Accordingly, such action by the Examiner is respectfully requested.

If a telephone conference would expedite allowance or resolve any additional questions, such a call is invited at the Examiner's convenience.

Respectfully submitted,

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